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U.S. Department of Energy
Office of River Protection
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

SEP 2 4 2008

08-ESQ-229

Ms. Jane A. Hedges, Program Manager
Nuclear Waste Program
Washington State
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

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Dear Ms. Hedges:

REQUEST FOR PROCEDURAL CLOSURE OF GROUT TREATMENT FACILITY (GTF)

The U.S. Department of Energy, Office of River Protection, and CH2M HILL Hanford Group, Inc., are requesting Washington State Department of Ecology approval of the attached petition for Procedural Closure of the GTF and its ancillary equipment in accordance with Section 6.3.3 of the Hanford Federal Facility Agreement and Consent Order Action Plan.

We are requesting expedited approval of the procedural closure by September 30, 2008, to eliminate the need for submittal of a re-certified Part A form as a part of the contract transition we are currently implementing. The Procedural Closure process for the GTF has been discussed and worked in advance with Ms. Greta Davis of your staff.

If you have any questions, please contact me, or your staff may contact Lori A. Huffman, Director, Environmental Compliance Division, (509) 376-0104.

Sincerely,

Shirley J. Olinger, Manager
Office of River Protection

ESQ:LAH

Attachment

TSD# TD-2-1

Attachment
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Grout Treatment Facility
Procedural Closure Technical Data Synopsis

Grout Treatment Facility
Procedural Closure
Technical Data Synopsis

1.0 Introduction

1.1 Purpose

The purpose of this document is to support the request for procedural closure of the Grout Treatment Facility (GTF) and its ancillary equipment in accordance with Section 6.3.3 of the Hanford Federal Facility Agreement and Consent Order (HFFACO, or Tri-Party Agreement) Action Plan.

The information presented herein demonstrates that the GTF has never treated, stored, or disposed of dangerous waste, including mixed waste, except as provided by Washington Administrative Code (WAC) 173-303-200 and WAC 173-303-802 and therefore none of the waste numbers or process codes listed in the Part A apply. No plans exist to manage dangerous or mixed waste in the GTF. The procedural closure of the GTF will modify the Hanford Facility Resource Conservation and Recovery Act of 1976 (RCRA) Permit (WA 789000 8967) by removing the GTF Part A, Form 3. This modification will be made once the procedural closure process is completed.

1.2 Previous Application Submittal

The initial GTF Dangerous Waste Part B Permit Application, DOE/RL 88-27 Revision 0 was submitted to Washington State Department of Ecology (Ecology) in November 1988. The last revision to the GTF Dangerous Waste Part B Permit Application, DOE/RL 88-27 Revision 2, was submitted to Ecology in July 1992.

Ecology did not take action on the GTF Dangerous Waste Permit Part B application, and the GTF Part A has been maintained as part of the Hanford RCRA Permit. The most recent GTF Part A, Form 3, Revision 7 was submitted to Ecology on December 22, 1999. Ecology approved GTF Part A, Form 3, Revision 7 on October 21, 2002.

The GTF was designed to treat the liquid portion of the Double-Shell Tank (DST) waste inventory for disposal in near surface underground vaults. This GTF mission was put on hold pending a decision on how to treat and dispose of both DST and Single-Shell Tank (SST) waste. In 1993, HFFACO Change Package M-01-93-01was approved to support use of an alternative treatment technology under WAC 173-303-610(1)(e).

GTF has never received or treated dangerous waste and continues to be in cold standby condition. The U.S. Department of Energy, Office of River Protection (ORP) and CH2M HILL Hanford Group, Inc. (CH2M HILL), have determined that GTF is no longer needed to support tank farm closure and should be procedurally closed in accordance with Section 6.3.3 of the HFFACO Action Plan.

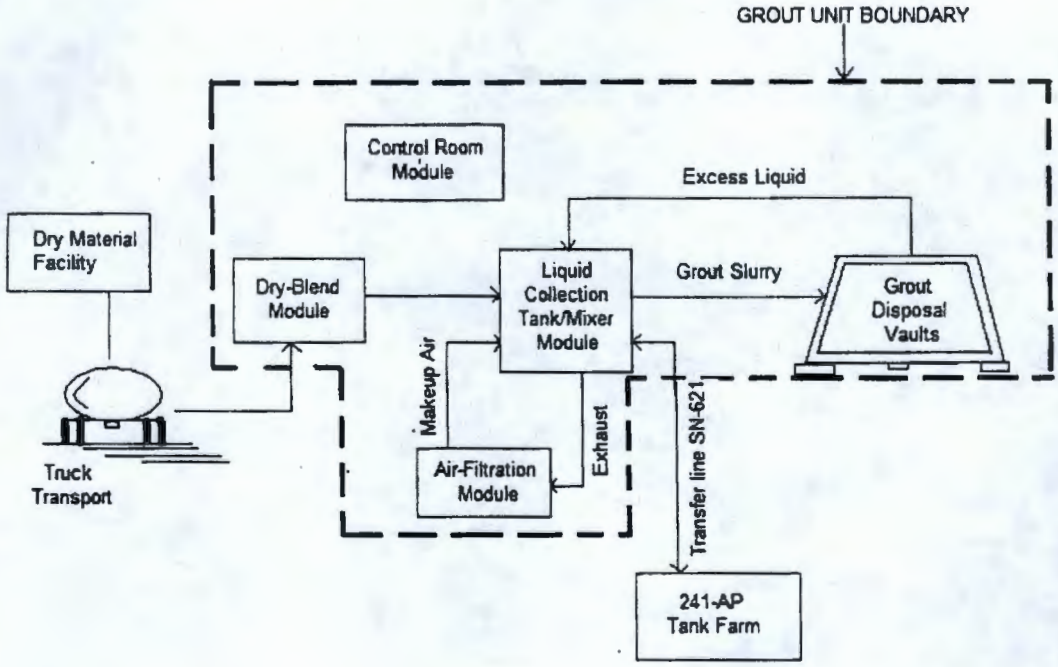
2.0 Facility Description

The GTF consists of a number of modules constructed between May 1985 and January 1988 as part of projects B-340, B-475 (A and B), B-492, and B-566. These modules include:

- Dry-Blend Module (DBM);
- Liquid Collection Tank and Mixer Module (LCTMM);
- Grout Disposal Vaults (GDV) (V-101, V-102, V-103, V-104, and V-105);
- Waste handling ancillary equipment/piping associated with each of the above; and
- Non-waste handling support buildings and ventilation system.

Figure 1 illustrates the unit boundary footprint taken from the Part A Form 3. This is the only portion of the facility that had any activity and therefore is subject to procedural closure. The transfer line SN-621 is part of the DST System and runs from the Tank AP-102 02D pit to the GTF LCTMM. Line SN-621 was used during the demonstration period to transfer non-dangerous low-level waste from AP Farm to LCTMM, and newly generated waste water back to 241-AP-102 and 241-AP-104. This transfer line was taken out of service in 2003 to enable construction of transfer lines from Tank Farms to the Waste Treatment and Immobilization Plant (WTP).

Figure 1: Grout Treatment Facility Flow/Boundary



The GTF process was designed to be a batch process consisting of approximately 1,000,000 gallons (3,785,400 liters) of DST waste for each campaign. The DST waste would have been sampled, analyzed, and characterized to ensure that it met waste feed acceptance criteria before it was qualified for treatment and disposal. After the waste had been qualified for processing, the waste would have been pumped through transfer line SN-621 to the LCTMM, where it would have been mixed with various combinations of dry solids and, if necessary, liquid additives to aid in grout processing. The resultant slurry would have been pumped through an encased pipe to concrete GDV systems. Each vault consists of a double liner and a Liquid Detection, Collection and Removal System. The GDV retained the grout slurry during the curing process and as the final form.

During grout filling operations and for several days following the completion of grout emplacement, it was anticipated that some liquid could still remain on top of the grout waste form. Separated liquid was expected to rise to the surface of the grout because of the settling of solids within the grout matrix. During the curing period, this excess water was to collect at the corners of the GDV. At the completion of the curing period, excess liquid and any flush water to be used during the process operation were to be pumped from the corners of the vault using up to four excess-water-removal pumps. The excess-water-removal pump was to be lowered through the layer of excess water to the surface of the cured grout. The excess water would then have been recycled back to the LCTMM for use in the next campaign or transferred to the DST system.

The Part A, Form 3 for the GTF describes the unit as being designed to treat mixed waste by mixing the liquid waste with grout-forming solids in an in-line mixer, which is part of a unit called the Grout Processing Facility (Figure 2).

Figure 2: Grout Processing Facility

The GDVs were to be operated as a surface impoundment while the grouted waste slurry hardened. Once the slurry material hardened, the GDV was to be closed as a landfill. During the demonstration period only V-101 received non-dangerous low-level waste grout (see Section 3.1 for description of the waste). The remaining four vaults have never received waste or grout material.

Figure 3: Grout Treatment Facility Vaults during construction

The LCTMM contains the grout mixer, grout surge tank, grout pump, a valve skid, an instrument skid, and the Liquid Collection Tank (LCT). The LCT serves to collect all contaminated liquids that are not incorporated into the grout, including any spills or leakage collected in the main sump, spent flush and decontamination solutions from internal and external system cleanups, and excess liquid and leachate pumped back to the LCTMM from the disposal vaults. The LCT has a design capacity of 3,028 liters (800 gallons) (Figure 4).

Figure 4: Grout Liquid Collection Tank

3.0 Process Information and Data Gathering

3.1 Operations History

Prior to the proposed start of operations with RCRA regulated waste, the GTF technology and process operations were demonstrated from August 1988 through October 1989 with the treatment of approximately 3,785,400 liters (1,000,000 gallons) of non-dangerous low level waste feed. Table 1 lists the timeline of operational activities and the transfer of non-dangerous low level waste feed from 241-AP-102 to GTF and the transfer of any process liquids/waste generated at GTF to 241-AP-102.

Table 1: 241-AP-102 Transfer History and Grout Treatment Facility Operation Demonstration Timeline

Date	Description	Level measurement (inches)[1]	Volume (kgal)[2]
8/29/1988	AP-102 level measurement	391.3	
8/30/1988	Initial startup of **Part I** of Grout demonstration campaign		
8/30/1988-9/1988	Simulated waste demonstration[3]		40
9/1/1988 - 9/30/1988	AP-102 Outflow to LCTMM (transfer #1)		80
10/1/1988- 10/30/1988	AP-102 Outflow to LCTMM (transfer #2)		242
10/3/1988	AP-102 level measurement	360.1	
11/28/1988	AP-102 level measurement	271.8	
12/1/1988- 12/30/1988	AP-102 Outflow to LCTMM (transfer #3)		3
12/5/1988	AP-102 level measurement	271.8	
4/1/1989- 4/30/1989	AP-102 Outflow to LCTMM (transfer #4)		2
4/17/1989	AP-102 level measurement	269.5	
4/27/1989	Shutdown GROUT (end of Part I of demonstration campaign – LCTMM emptied to grout vault 101)		
5/1/1989- 5/30/1989	AP-102 Outflow to LCTMM (transfer #5)		174
5/1/1989	AP-102 level measurement	207.2	
6/1/1989	Begin receiving essential material for **Part II** of Grout demonstration campaign		
6/1/1989- 6/30/1989	AP-102 Outflow to LCTMM (transfer #6)		258
6/19/1989	Startup of **Part II** of Grout demonstration campaign		
6/19/1989	AP-102 level measurement	200.3	
6/26/1989	AP-102 level measurement	115.5	
7/6/1989- 7/11/1989	AP-102 Outflow to LCTMM (transfer #7)		239
7/6/1989	AP-102 level measurement	89.8	
7/11/1989	Shutdown GROUT (end of Part II of demonstration campaign – LCTMM emptied to grout vault 101)		
7/12/1989- 7/30/1989	Flush Water From Miscellaneous Sources to AP-102 (transfer #1)[4]		72
7/24/1989	AP-102 level measurement[4]	27.0	
7/29/1989	AP-102 level measurement[4]	44.7	
8/1/1989- 8/30/1989	Flush Water From Miscellaneous Sources to AP-102 (transfer #2)[4]		124
9/1/1989-	PUREX Ammonia Scrubber Feed AP-102		127

Date	Description	Level measurement (inches)[1]	Volume (kgal)[2]
9/30/1989	(transfer #1) [4]		
10/1/1989	PUREX Ammonia Scrubber Feed AP-102 (transfer #2) Start [4]		129
10/1/1989	AP-102 level measurement [4]	48.3	

Notes:

1 Source: Surveillance Analysis Computer System (SACs)
2 Source: Tank Waste Information Network System (TWINS)
3 Source: Phosphate Sulfate Waste Grout Campaign Report (WHC-SD-WM-ER-059, rev 0)
4 Post Grout demonstration volume measurements added for completeness and post campaign returns

During the demonstration period only vault V-101 received non-dangerous low-level waste grout. Raw water was added to the V-101 for flushing LCTMM and the transfer lines. The excess liquid was recycled back to the V-101 to keep the surface of the grout moist and assure full hydration. This liquid included phosphate-sulfate compounds. At the end of the curing process the remaining liquid in the LCTMM was determined to be newly generated waste water and was transferred to the DST system (241-AP-102). Approximately 194,665 liters (51,425 gallons) was transferred to 241-AP-102. These transfers are included as part of the "flush water from miscellaneous sources" identified in the table above. The pH of the waste in the LCTMM after the conclusion of the GTF demonstration campaign was found to be greater than 12.5 and therefore the waste water was characteristically corrosive (D002) pursuant to WAC 173-303-090 (6). The newly generated dangerous waste was accumulated for less than 90 days in accordance with WAC 173-303-200(1)(a) and the receiving Treatment Storage and Disposal was operated under WAC 173-303-400 regulations for an interim status unit.

No spills or other contamination events occurred during the technology and process operations demonstration between August 1988 and October 1989.

3.2 Data Gathering for GTF Activities

Records review and field inspections were used to establish whether any regulated waste treatment, storage, or disposal activities took place in the GTF. The approach used and the results of this effort are described in the following sections.

3.2.1 Approach

Two primary sources of information were utilized to determine that procedural closure is appropriate and to assure that the certification statement provided in this procedural closure request is true, accurate, and complete. The information sources include:

- Review of operational documentation used for GTF technology and processing demonstration and operations under the permit; and
- Onsite review of the GTF equipment.

3.2.2 Operational Documentation

Due to the time lapse from completion of the Grout demonstration project, most of the project documentation that existed in hard copy was transferred to central files. This report reflects the review of the best available data from the operations that was retrievable from the central files.

During the demonstration period log books, and test results/summaries were used to document operational conditions. The "Phosphate Sulfate Waste Grout Campaign Report" (WHC-SD-WM-ER-059 Revision 0) summarizes this information.

WHC-SD-WM-ER-059 states that the demonstration campaign was divided into two halves. Table 1 provides the chronological order of the 241-AP-102 waste level and transfer history as it fits with the GTF operation demonstration timeline. The Start and End dates listed in Table 1 are in **bold** for ease of locating.

The first half of the campaign consisted of two parts. Part I was initiated in August 1988 with the startup of the Transportable Grout Equipment which included the receiving of dry material at the DBM, and the blending of dry material with raw water and waste at the LCTMM. The controls and ventilation support were also reviewed for problem areas during this phase. Deficiencies in the ventilation system resulted in design changes to this portion of the system. Part I was concluded in October 1988. Three-hundred-sixty seven thousand (367,000) gallons of waste feed was processed during Part I which concluded in October 1988. After the additional design on the ventilation system was completed, Part II of the campaign was started on April 13, 1989, and completed on April 27, 1989.

The second half (Part II) of the campaign began in June 1989 and processed approximately 600,000 gallons of waste feed by July 1989. Facility engineering logbook WHC-N-181-1 covers the campaign and was reviewed to verify the above information.

The resulting low-level grout material was transferred to V-101 where it continues to be stored. WHC-SD-WM-ER-059 includes graphs of the curing temperature and a liquid collection rate during the campaign as well as a surface profile of the V-101 after completion of the demonstration campaign.

A number of dry ingredient samples were collected and analyzed during the campaign for process development and control. Liquids generated from the grouting process were sampled and analyzed for waste designation purposes. The analytical results are contained in "Chemical Analysis of PSW Leachate" (DSI-90031). From this information, the newly generated waste in V-101was given the D002 characteristic waste code designation and transferred to 241-AP-102.

3.2.4 Field Evaluations

A facility walkthrough was conducted on August 19, 2008, by Base Operations environmental staff. Specific verification of the following data points was obtained as part of the walkthrough, including:

- Power to control room has been isolated to ensure the unit cannot be operated;
- Physical condition of the unit modules was observed to determine potential areas of contamination or past spills. No signs of contamination or spills were observed; and
- Chemical containers and process equipment were reviewed for the presence of chemicals or waste currently in the system. Other than non-dangerous grouted waste stored in V-101, there was no evidence of chemicals or waste present in the process system based on pressure and level gauges.

4.0 Summary

No activities have been conducted within the GTF that would constitute treatment, storage, or disposal of dangerous or mixed waste, and none are planned to take place. The GTF was designed to treat the liquid portion of the DST waste inventory for disposal in near surface underground vaults. This GTF mission was put on hold pending a decision on how to treat and dispose of both DST and SST waste, and ultimately this approach was abandoned and was never used for its intended purpose.

Construction of the WTP began October 2001, which replaced the proposal for this unit to treat and dispose of DST and SST waste.

A demonstration was conducted between 1988 and 1989 with non-dangerous waste grout that was stored in Grout Vault designated as V-101. All liquid that resulted from this demonstration was collected and disposed of. A field evaluation of the GTF was conducted August 2008 to verify that there were no signs of contamination or spills, and that there were no chemical containers present.

ORP and CH2M HILL request that procedural closure in accordance with Section 6.3.3 of the HFFACO Action Plan be approved by Ecology.

5.0 Grout Treatment Facility Procedural Closure Technical Data Synopsis Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

9/24/08

Owner/Operator
Shirley J. Olinger, Manager
U.S. Department of Energy
Office of River Protection

Date

9/25/08

Co-Operator
John C. Fulton, President/COO
CH2M HILL Hanford Group, Inc.

Date